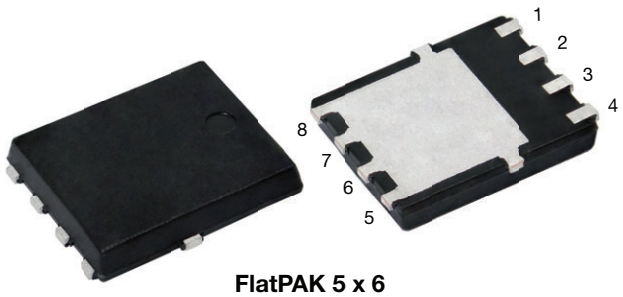
High Current Density Surface-Mount Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.34 V at I_F = 5 A



FlatPAK 5 x 6

FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified available
  - Automotive ordering code: base P/NHM3
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE GRADE Available

RoHS COMPLIANT

HALOGEN FREE

LINKS TO ADDITIONAL RESOURCES

3D Models

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	20 A
V_{RRM}	45 V
I_{FSM}	220 A
V_F at I_F = 20 A (T_A = 125 °C)	0.46 V
T_J max.	165 °C
Package	FlatPAK 5 x 6
Circuit configuration	Single

TYPICAL APPLICATIONS

For use in low voltage high frequency DC/DC converters, freewheeling diodes, and polarity protection applications.

MECHANICAL DATA

Case: FlatPAK 5 x 6
Molding compound meets UL 94 V-0 flammability rating
Base P/N-M3 - halogen-free, RoHS-compliant
Base P/NHM3 - halogen-free, RoHS-compliant, and AEC-Q101 qualified

Terminals: matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
M3 and HM3 suffix meets JESD 201 class 2 whisker test

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**V20KM45**	**UNIT**
Device marking code		20M45	
Maximum repetitive peak reverse voltage	V_{RRM}	45	V
Maximum DC forward current per device	$I_{F(AV)}$ (1)	20	A
	$I_{F(AV)}$ (2)	5.2	
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	220	
Operating junction temperature range	T_J (3)	-40 to +165	°C
Storage temperature range	T_{STG}	-55 to +165	

Notes

(1) With infinite heatsink
(2) Free air, mounted on recommended pad area
(3) The heat generated must be less than the thermal conductivity from junction-to-ambient: $dP_D/dT_J < 1/R_{\theta JA}$

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage	I_F = 5 A	T_A = 25 °C	V_F (1)	0.46	-	V
	I_F = 10 A			0.50	-	
	I_F = 20 A			0.56	0.65	
	I_F = 5 A	T_A = 125 °C		0.34	-	
	I_F = 10 A			0.39	-	
	I_F = 20 A			0.46	0.52	
Reverse current	V_R = 45 V	T_A = 25 °C	I_R (2)	-	0.15	mA
		T_A = 125 °C		5	20	
Typical junction capacitance	4.0 V, 1 MHz		C_J	3100	-	pF

Notes

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: pulse width ≤ 5 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)(2)	75	-	°C/W
	$R_{\theta JM}$ (3)	2.5	3.5	

Notes

(1) The heat generated must be less than thermal conductivity from junction to ambient: $dP_D/dT_J < 1/R_{\theta JA}$

(2) Free air, mounted on recommended copper pad area; thermal resistance $R_{\theta JA}$ - junction-to-ambient

(3) Mounted on infinite heatsink; thermal resistance $R_{\theta JM}$ - junction-to-mount

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
V20KM45-M3/H	0.10	H	1500	7" diameter plastic tape and reel
V20KM45-M3/I	0.10	I	6000	13" diameter plastic tape and reel
V20KM45HM3/H (1)	0.10	H	1500	7" diameter plastic tape and reel
V20KM45HM3/I (1)	0.10	I	6000	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)

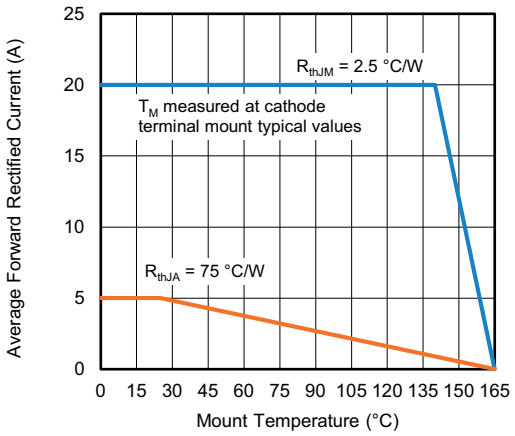


Fig. 1 - Maximum Forward Current Derating Curve

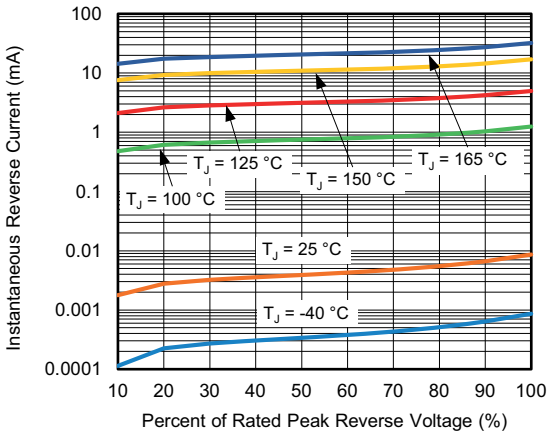


Fig. 4 - Typical Reverse Leakage Characteristics

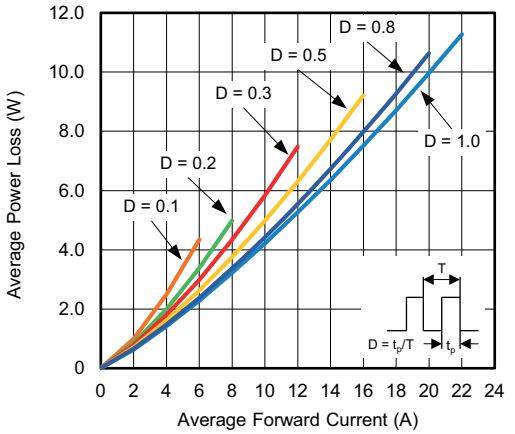


Fig. 2 - Forward Power Loss Characteristics

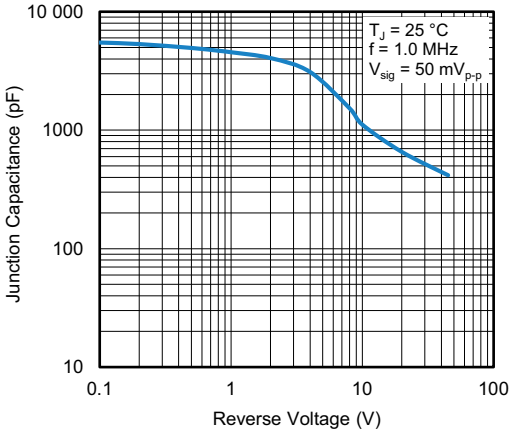


Fig. 5 - Typical Junction Capacitance

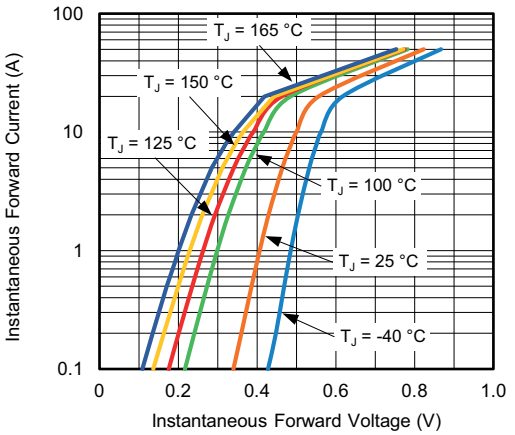


Fig. 3 - Typical Instantaneous Forward Characteristics

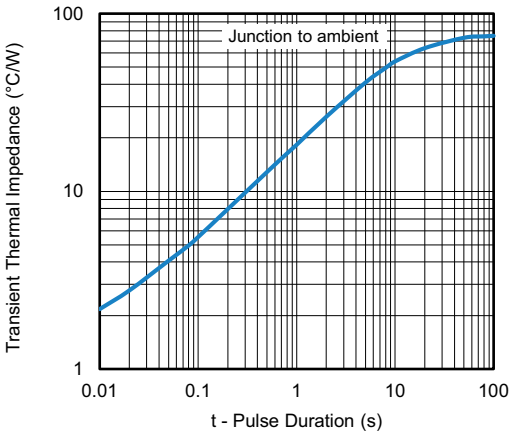
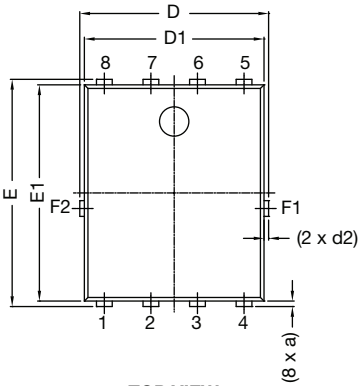


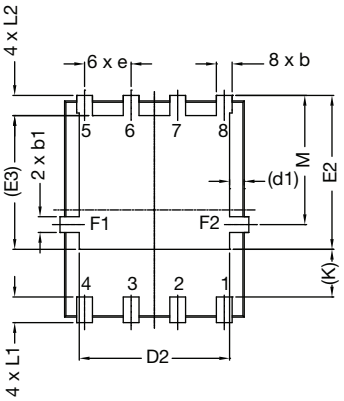
Fig. 6 - Typical Transient Thermal Impedance

DIMENSIONS in inches (millimeters)

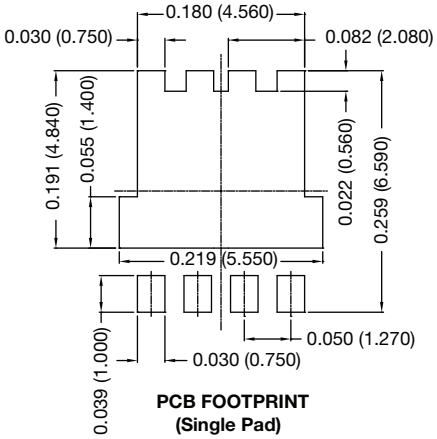
FlatPAK 5 x 6 (Single)



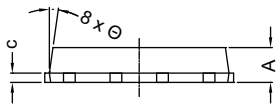
TOP VIEW



BOTTOM VIEW
(Single Pad)



PCB FOOTPRINT
(Single Pad)



SIDE VIEW

DIM.	INCHES			MILLIMETERS		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.035	0.039	0.043	0.89	0.99	1.09
(a)	-	0.006	-	-	0.15	-
b	0.013	0.017	0.020	0.32	0.43	0.52
b1	0.013	0.017	0.020	0.32	0.43	0.52
c	0.008	-	0.014	0.20	-	0.35
D	0.197	0.203	0.209	5.00	5.15	5.30
D1	0.189	0.193	0.197	4.80	4.90	5.00
D2	0.154	0.161	0.169	3.90	4.10	4.30
(d1)	-	0.016	-	-	0.40	-
(d2)	-	0.005	-	-	0.125	-
E	0.238	0.244	0.250	6.05	6.20	6.35
E1	0.228	0.232	0.236	5.80	5.90	6.00
E2	0.157	0.165	0.173	4.00	4.20	4.40
(E3)	-	0.144	-	-	3.65	-
e	0.050 BSC			1.27 BSC		
(K)	0.039	-	-	1.00	-	-
L1	0.019	-	0.043	0.48	-	1.10
L2	0.012	-	0.031	0.30	-	0.80
M	0.128	0.138	0.148	3.25	3.50	3.75
Θ	0°	-	10°	0°	-	10°

Notes

- Dimensioning and tolerancing per ASME Y14.5-2009
- Dimensions D1 and E1 do not include mold flash or gate burrs
- Dimension (XX) means reference only

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